Developmental Probabilistic Snow Accumulation Forecast for Denver International Airport

Probabilistic Snow Forecast: History of the PSA product in use at WFO BOU

- *DIA Ground operations would call frequently trying to make sense of the forecast, or gather more details, not available from…*
  - *TAF, Zone forecasts, point and click map*
- *"A more probabilistic forecast of snow amounts given certain ranges of snow for staffing and equipment"*
- *DIA came up with the snowfall ranges being used.*
- *Developed by WFO BOU SOO, Dr. Eric Thaler*
- *Now in our 3rd snow season using this product.*

Developmental Probabilistic Snow Accumulation Forecast for DIA- *INPUT*

- Based on input from the short term and long term forecasters.

- Initialize at 0230 and 1430 local time (times based on DIA operational needs for staffing purposes)

- Amendments are made at 0930 and 2000 local time or when changes are needed.

Developmental Probabilistic Snow Accumulation Forecast for DIA- *INPUT*

Developmental Probabilistic Snow Accumulation Forecast-
Output to WFO BOU home page at
http://www.crh.noaa.gov/bou/?n=aviation

Developmental Probabilistic Snow Accumulation Forecast
Output

Developmental Probabilistic Snow Accumulation Forecast
National Weather Service Denver/Boulder, Colorado
0303 MST Monday January 10, 2011

This developmental product contains the probabilities (%) that the given snow amounts (inches) will occur at Denver International Airport during the respective 6- or 12-hour periods. The probabilities indicate the amount of snow that will fall from the clouds. They do not consider the amount of melting that may or may not occur on various ground surfaces. [T (trace) means more than zero.]

Short Term Discussion (10/12Z-11/12Z): Snowfall will gradually diminish this morning but minor accumulations are still expected through mid to late morning. Additional accumulation is expected to be around an inch. A few flurries still possible this afternoon but little or no accumulation.

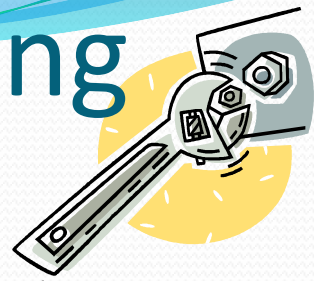| Day/Hour GMT	0"	T or more	1" or more	3" or more	6" or more	10" or more
10/12-10/18	0	100	20	0		
10/18-11/00	60	40	0	0		
10/12-11/00					0	0
11/00-11/06	100	0	0	0		
11/06-11/12	100	0	0	0		
11/00-11/12					0	0

Long Term Discussion (11/12Z-12/12Z): No snow is expected during the period.

Day/Hour GMT	0"	T or more	1" or more	3" or more	6" or more	10" or more
11/12-11/18	100	0	0	0		
11/18-12/00	100	0	0	0		
11/12-12/00					0	0
12/00-12/06	100	0	0	0		
12/06-12/12	100	0	0	0		
12/00-12/12					0	0

Deterministic Forecast for Denver International Airport
515 AM MST Monday January 10, 2011

Valid at MM/DD:UT	Sky %	PoP %	CWR %	AT F	Td F	RH %	Wind(mph) Dir	Sp	Gs	QPF inch	Snow inch	Tx F	RHn %	Tn F	RHx %
01/10:12	98	60	38	6	3	86	N	12	16	----	---				
01/10:13	96	60	38	7	3	84	N	10	12						
01/10:14	96	60	38	7	3	84	N	9						6	100
01/10:15	95	60	38	6	3	87	NNE	8	10	0.03	0.6				
01/10:16	95	60	38	10	4	77	NNE	9							
01/10:17	93	60	38	12	5	73	NNE	10							
01/10:18	93	20	4	14	6	69	NNE	12	17	----	---				
01/10:19	83	20	4	14	6	68	NNE	12							
01/10:20	83	20	4	12	5	73	NE	9							
01/10:21	77	20	4	14	5	66	NE	8	8	0.01	0.2				
01/10:22	77	20	4	13	4	66	ENE	7							
01/10:23	77	20	4	12	3	67	E	5				14	64		
01/11:00	58	5	1	10	2	69	E	3	3	----	---				
01/11:01	58	5	1	9	1	68	ESE	3							
01/11:02	58	5	1	8	-1	66	ESE	3							
01/11:03	58	5	1	6	-3	65	SE	3	3	0.00	0.0				
01/11:04	58	5	1	5	-4	64	SSE	3							
01/11:05	58	5	1	4	-6	64	S	3							
01/11:06	15	0	0	3	-7	63	SSW	5	5	----	---				
01/11:07	15	0	0	2	-8	65	SSW	5							
01/11:08	15	0	0	2	-8	62	SSW	6							
01/11:09	17	0	0	0	-9	65	SW	8	8	0.00	0.0				
01/11:10	17	0	0	1	-10	59	SW	12							
01/11:11	17	0	0	4	-11	48	SW	16							
01/11:12	18	0	0	4	-12	48	SW	18	28	----	---				
01/11:13	18	0	0	4	-10	51	SSW	17							
01/11:14	18	0	0	1	-8	66	SSW	15						-5	93
01/11:15	18	0	0	-4	-5	93	S	10	16	0.00	0.0				
01/11:16	18	0	0	6	-4	65	S	9							
01/11:17	18	0	0	12	-2	54	SSW	8							
01/11:18	33	0	0	18	0	45	SSW	8	8	----	---				
01/11:19	33	0	0	19	1	46	S	6							
01/11:20	33	0	0	18	2	49	SSE	5							
01/11:21	33	0	0	19	2	49	SSE	3	3	0.00	0.0				
01/11:22	33	0	0	19	2	48	SE	3							
01/11:23	33	0	0	18	1	48	SE	5				19	44		
01/12:00	40	0	0	13	1	57	ESE	6	6	----	---				
01/12:01	40	0	0	11	0	61	SE	6							
01/12:02	40	0	0	10	-1	61	S	7							
01/12:03	40	0	0	9	-2	61	SSW	7	7	0.00	0.0				
01/12:04	40	0	0	8	-2	62	SSW	7							
01/12:05	40	0	0	8	-2	62	SW	7							
01/12:06	40	0	0	6	-2	69	SW	8	8	----	---				
01/12:07	40	0	0	7	-2	68	SW	8							

The Nuts and Bolts of the Thing

- 25 grid points used around DIA, spaced using 40km resolution between grid points.

- SREF data using temperature, QPF, and thickness at the surrounding points.

- Computes the snow to liquid based on elevation and 1000/500mb thickness at each point at 3 different time periods.

- How many times was the snow threshold met at each grid point and then divide by 75. (total grid points around DIA and through time to get the probability)

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Questions?

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